CLAIMS

1. A method of manufacturing a billet for cold forging, wherein the first spherodizing annealing step of spherodizing a carbide in a blank, the drawing step of drawing the blank at a predetermined sectional area reduction ratio after the first spherodizing annealing step, and the second spherodizing annealing step of promoting the dispersion of the internal carbide for an increase spherodizing ratio after the drawing step.

2. A method according to claim 1, wherein said drawing step has a drawing ratio of approximately 20%.

3. A method according to claim 1, wherein said blank is cut to a desired dimension between said first spherodizing annealing step and said second spherodizing annealing step.

4. A method according to claim 1, wherein said blank is composed of 0.46-0.48 wt% of C (carbon), 0.14 or les of Si (silicon), 0.55-0.65 wt% of Mn (manganese), 0.015 wt% or less of P (phosphorus), 0.015 wt% or less of S (sulfur), 0.15 wt% or less of Cu (copper), 0.20 wt% or less of Ni (nickel) and 0.35 wt % or less of Cr (chromium).

5. A method of manufacturing a billet for cold forging, wherein the steps of quenching a blank unloaded from a heating furnace to form a fine martensitic structure in a surface thereof, and then annealing the blank to convert the martensitic structure of the surface into a fine spherodized structure comprising ferrite and cementite.

6. A method according to claim 5, wherein said blank is annealed by holding the blank at about 740° C for six hours, thereafter dropping the temperature to about 680° C at a rate of 20° C/h, and thereafter cooling the blank in a furnace.

7. A method according to claim 5, wherein said blank is annealed by holding the blank at about 750° C for 4 hours, then at about 735° C for 3.5 hours, thereafter dropping the temperature to about 680° C at a rate of 15° C/h, and thereafter cooling the blank in the furnace.

8. A method according to claim 5, wherein said blank in made of a carbon steel which is composed of 0.46-0.48 wt % of C (carbon), 0.14 or less of Si (silicon), 0.55-0.65 wt% of Mn (manganese), 0.015 wt% or less of P (phosphorus), 0.015 wt% or less of S (sulfur), 0.15 wt% or less of Cu (cooper), 0.20 wt% or less of Ni (nickel), 0.35 wt% or less of Cr (chromium), and a remainder of Fe (iron) and impurities.

9. A method of cold-forging a billet manufactured by a method according to claim 5, wherein the steps of cold-forging the billet for by continuously drawing the billet, upsetting the billet, and finishing the billet without softening the billet in an intermediate stage.

10. A crankshaft comprising a billet manufactured in accordance with the method of claim 1.

11. A crankshaft comprising a billet manufactured in accordance with the method of claim 5.

12. A method of cold-forging a crankshaft from a billet formed by continuous cold forging, wherein the first step of extruding the billet to form a multi-stepped shaft having at least two steps and contiguous to a main body, the second step of upsetting and drawing the formed work piece to simultaneously increase the diameter of the main body and reduce the diameter of at least a portion of the multi-stepped shaft, the third step of upsetting and drawing the formed work piece to simultaneously rough the main body to an

asymmetrical shape and reduce the diameter of at least a portion of the multi-stepped shaft, the fourth step of pressing an asymmetrical boundary of the main body to simultaneously finish the main body and form a central hole axially centrally in the main body, and the fifth step of forming a pin hole in the main body at a predetermined position and removing an outer circumferential portion of the main body thereby to shape the main body.

13. A method according to claim 12, wherein splines are formed on an end of said multi-stepped shaft in said fourth step.

14. A method of cold-forging a disk-shaped part with a shaft from a multi-stepped intermediate blank through a plurality of forging steps, characterized by forming an asymmetrical disk having left and right portions of different volumes with respect to an axial center of said intermediate blank.

15. A method according to claim 14, wherein the ratio of the volumes of the left and right portions of said disk is about 1:2.

16. A method according to claim 14, wherein in order to achieve the different volumes, inclined surfaces having different angles of inclination are formed across a junction between the left and right portions which extends from the shaft of the blank to the disk.

17. A method according to claim 16, wherein the angle of inclination of the portion having the greater volume is smaller than the angel of inclination of the portion having the smaller volume.

18. A method of cold-forming a crankshaft, wherein continuously cold-forming a blank mad of carbon steel, which is composed of 0.46-0.48 wt% of C (carbon), 0.14 or less of Si (silicon), 0.55-0.65 wt% of Mn (manganese), 0.015 wt% or less of P (phosphorus), 0.015 wt% or less of S (sulfur), 0.15 wt % or less of Cu (copper), 0.20 wt % or less of Ni

(nickel), 0.35 wt% or less of Cr (chromium), and a remainder of Fe (iron) and impurities, thereby to produce a crankshaft, and thereafter aging the crankshaft.

19. A method of cold-forging a crankshaft, wherein the first spherodizing annealing step of spherodizing a blank made of a carbon steel which is composed of 0.46-0.48 wt% of C (carbon), 0.14 or less of Si (silicon), 0.55-0.65 wt% of Mn (manganese), 0.015 wt% or less of P (phosphorus), 0.015 wt% or less of S (sulfur), 0.15 wt % or less of Cu (copper), 0.20 wt % or less of Ni (nickel), 0.35 wt% or less of Cr (chromium), and a remainder of Fe (iron) and impurities, the drawing step of drawing the blank at a predetermined sectional area reduction ratio after the first spherodizing annealing step, the second spherodizing annealing step of promoting the dispersion of an internal carbide of an increased spherodizing ratio after the drawing step thereby to produce a billet, continuously cold-forming the billet into a crankshaft, and thereafter aging the crankshaft.

20. A method according to claim 18, wherein the crankshaft is aged by holding the crankshaft at a temperature ranging from 250 to 350° C for 1 to 2.5 hours, and thereafter cooling the crankshaft to normal temperature.

21. A method of cold-forging a disk-shaped part with a shaft, characterized by holding the shaft of the cold-forged disk-shaped part with a lower support base of a forming die, lowering an upper die assembly to hold the disk of the disk-shaped part between the lower support base and an upper support base and lower the disk-shaped part by a predetermined stroke, punching a hole in a predetermined region of the disk with a punch of a lower die assembly, and thereafter lowering the upper die assembly to cause an upper die to remove an outer circumferential portion of the disk.

22. A method according to claim 21, wherein accommodating a scrap removed by the punch in a receptacle in the upper support base, holding a scrap removed by the upper die between the lower die assembly and the upper die, and thereafter, when the upper die assembly is lifted, placing the scraps into original positions thereof in the disk, and discharging the scraps when the disk-shaped part is ejected.

23. A method according to claim 19, wherein the crankshaft is aged by holding the crankshaft at a temperature ranging from 250 to 350° C for 1 to 2.5 hours, and thereafter cooling the crankshaft to normal temperature.